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CR-141954

EVALUATION OF ERTS-1 DATA APPLICATIONS TO GEOLOGIC MAPPING,  
STRUCTURAL ANALYSIS AND MINERAL RESOURCE INVENTORY OF SOUTH AMERICA  
WITH SPECIAL EMPHASIS ON THE ANDES MOUNTAIN REGION

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28 January 1974

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Type I Progress Report for Period 1 September - 31 October 1973

(E75-10119) EVALUATION OF ERTS-1 DATA APPLICATIONS TO GEOLOGIC MAPPING, STRUCTURAL ANALYSIS AND MINERAL RESOURCE INVENTORY OF SOUTH AMERICA WITH SPECIAL EMPHASIS ON THE ANDES MOUNTAIN REGION Bimonthly (Geological G3/43	N75-16040  Unclas 00119
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Prepared for:  
Goddard Space Flight Center  
Greenbelt, Maryland 20771

Publication authorized by the Director, U. S. Geological Survey.

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Type I Progress Report  
ERTS-1

- a) Title: Geologic Mapping, Structural Analysis and Mineral Resource Inventory of South America  
ERTS-1 Proposal No. SR-E189
- b) GSFC ID No. of P.I.: IN-012
- c) Statement and explanation of any problems that are impeding the progress of the investigation

ERTS-1 data for this project was cut off by NASA/GSFC at the end of July 1973 in accordance with the original proposed contract time period. An extension has been requested through the contract monitor to supply subsequent data for the 12 proposed areas of South America. Only data having 30% cloud cover or less are desired. The period of data extension was from July 31, 1973, to June 30, 1974. Three sets of 9 x 9 inch positive transparencies of each image are desired for local use and distribution to South American counterparts. No response from NASA has yet been received, nor has any new data been forthcoming.

- d) Discussion of the accomplishments during the reporting period and those planned for the next reporting period.

Twenty-two images were selected for compiling an ERTS-1 mosaic of Area 7 of my proposal encompassing southern Peru, western Bolivia and northern Chile. The area lies between 16 and 20 degrees South and 66 and 72 degrees West. Because La Paz is the largest human habitation in the area, it will be referred to as the La Paz Mosaic. Although not all the scenes are cloud free, there is sufficient coverage to study most of the area. Band 6 images were selected for the laydown material so that the remaining bands can be used for detailed interpretive work and color compositing.

The mosaic compilation will be done at EROS expense by the USGS Topographic Division's Special Mapping Center at Reston, Va., in a period of 6 to 8 weeks. It will be the first of 12 mosaics proposed under this project.

On completion of the mosaic an interpretive overlay of tecton-linear features will be made and correlated with the distribution of known mineral deposits of the area. The overlay will be compared with similar interpretations by cooperating investigators and a composite showing relative confidence levels will be made. Other supporting maps will be made from existing map bases dealing with geology, metallogenetic provinces and earthquake epicenters of earthquakes having a magnitude of 4 or greater on the Richter Scale.

- e) Discussion of significant scientific results and their relationship to practical applications or operational problems (Abstract)

A color composite of image E1010-14035, dated 2 August 1972, was made by the General Electric Company for Project SR-189 and sent to the Bolivia Project under Dr. Carlos Brockmann. The scene covers the west central Bolivian Altiplano near Salar de Coipasa. It clearly shows the distribution of surface water and scant patches of vegetation. The Salar de Coipasa is the largest body of water in the area, about 10km wide and 13km long (130km<sup>2</sup>) of dark blue fresh water. A lighter blue area south of the lake suggests a thin cover of highly saline water superposed on salt beds. The scattered vegetation patches, all less than 5km long and 1-2km wide, are presumed to be native grasses, lichens and possibly Indian potato and maize areas although no distinct agricultural patterns have been identified.

Brockmann and his team have made a detailed study of the scene providing 12 different interpretive overlays including geology, volcanology, soils, hydrology and relative permeability. They found that color composites provide at least 40% more information than do black and white renditions of the same scene.

An excellent example of change detection was provided by the above scene with E1244-14051, dated 24 March 1973. Water in the Salar de Coipasa has more than doubled in area (20x20km or 400km<sup>2</sup>) as a result of the rains of the "Bolivian Winter" which generally occur in the February-March period. The Salars, as Dr. George Stoertz pointed out earlier, are excellent and highly sensitive moisture indicators in this highly arid region.

- f) A listing of published articles and/or papers, preprints, in-house reports, abstracts of talks that were released during the reporting period.

None.

- g) Recommendations concerning practical changes in operations, additional investigative effort, correlation of effort and results as related to a maximum utilization of the ERTS system

With the Brazilian reception station at Cuiaba and its new processing station coming on line, I would appreciate the opportunity to evaluate their data in comparison with that which has been processed at GSFC/NDPF.

- h) A listing by date of any changes in the Standing Order Forms.

None.

- i) ERTS Image Descriptor Forms.

None.

- j) Listing by date of changed Data Request Forms.

None.

- k) Status of Data Collection Platforms.

Not applicable.